Case Report

Abdominal aortic aneurysm and hepatocellular carcinoma: a one-stage approach

EA Bastounis, ES Felekouras, AJ Arvelakis, SE Georgopoulos, J Griniatsos and EL Papalambros

First Department of Surgery, University of Athens Medical School, Athens, Greece

Background

The operative management of abdominal aortic aneurysm (AAA) and co-existing intra-abdominal malignancy has been a long-standing controversy. It is unclear whether a single-stage or a two-stage approach is the more appropriate therapeutic option and also which lesion should be treated first.

Case outline

An 82-year-old man with a 4×5-cm mass in the left liver (segment IV), suspected to be a hepatocellular carcinoma (HCC), had a concomitant 6-cm infrarenal AAA. At the same operation he underwent a left hepatectomy followed by repair of the aneurysm. He was discharged on the 17th postoperative day. To the best of our knowledge, this is the third report in the world literature of a patient who underwent a successful simultaneous resection of an AAA and HCC and the first in which the liver resection was performed first.

Discussion

We recommend liver resection and AAA repair in a single-stage procedure, regardless of the time sequence of the procedures. This approach can be considered safe, and the theoretical risk of graft infection can be kept to a minimum.

Key words

hepatocellular carcinoma, abdominal aortic aneurysm

Introduction

The management of abdominal aortic aneurysm (AAA) and co-existing intra-abdominal malignancy remains controversial. These lesions can be resected in either a one-stage or a two-stage operation, and the best order of proceeding is uncertain [1]. Existing data mainly concern AAA and neoplasms of the gastrointestinal tract or urinary system; only two cases of hepatocellular carcinoma (HCC) and AAA have been reported previously [2].

We describe case of simultaneous liver resection and AAA repair.

Case report

An 82-year-old Greek Orthodox priest was admitted with a mass in the left liver and an AAA, which were seen on an ultrasound scan performed for upper abdominal discomfort. Abdominal CT scan revealed a tumour in segment IV of the liver, measuring 4×5 cm in size, plus an infrarenal abdominal aortic aneurysm (AAA) that was 6 cm in diameter (Figure 1A). An elevated AFP (647 ng/ml) was considered diagnostic for hepatocellular carcinoma (HCC). The history and physical examination did not reveal any previous liver or cardiovascular disease, except for moderate chronic obstructive pulmonary disease. A complete preoperative metastatic work-up was negative.

The patient initially underwent left hepatectomy (Figure 1B), followed by aneurysmectomy and aorto-bi-iliac bypass, due to occlusive disease of the proximal common iliac arteries (Figure 1C). He remained stable throughout the procedure. The operative time was 240 minutes, and three units of blood were transfused. After a 2-day stay in the intensive care unit, he recovered uneventfully and was discharged from hospital on the 17th postoperative day. Liver histology revealed well-differentiated HCC. The patient refused any additional treatment for the HCC and was still alive at 3–year follow-up.

Discussion

The timing of repair of an AAA and a concurrent malignancy is a difficult problem. Delay in the surgical treatment

Correspondence to: *J Griniatsos, Flat 2, 1B Oak Road, Ealing Broadway, London W5 3SS, UK (e-mail: johngrin@hotmail.com)*

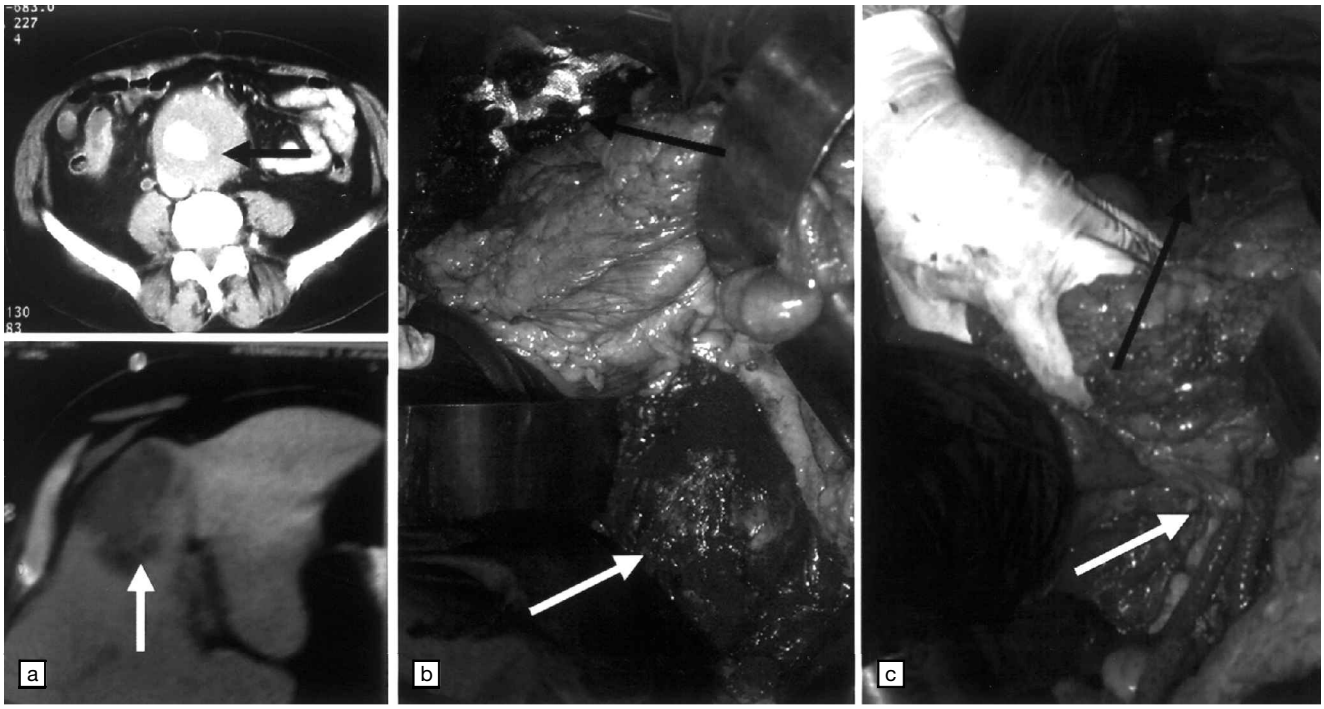

Figure 1. *(a) CT scan of the abdomen showing the liver tumor (white arrow) and the AAA (black arrow). (b) Intra-operative images of the liver resection (black arrow) and the aneurysm (white arrow). (c) Intra-operative images of the liver resection (black arrow) and aorto-bi-iliac graft (white arrow).*

of either lesion carries inherent risks (aneurysmal rupture or cancer spread), while resection of both lesions carries an increasing peri-operative risk and a likelihood of graft contamination.

When gastrointestinal cancer is associated with AAA, treatment of the symptomatic disease comes first [3, 4]. If there is no absolute indication for treatment of either lesion, the decision regarding the order and timing of the two operations can be difficult.

There is no clear consensus in the literature. Szilagyi and colleagues [3] recommend a two-stage approach, whereas other authors perform a one-stage procedure [4]. Lobbato and co-authors [5] surveyed the opinions of 46 specialists in general and vascular surgery in the USA on this matter. One third of the responders favoured excision of the carcinoma followed later by AAA repair, one third favoured excision of the aneurysm followed later by resection of the carcinoma, and the remaining one third stated that they would withhold a decision until laparotomy was performed. Only two responders reported that they would perform simultaneous resection of both lesions. Yet some authors have suggested that operation for gastrointestinal malignancy and AAA repair may be performed safely at the same time provided that the retroperitoneum is closed before tumour surgery is started [6, 7].

The co-existence of an AAA larger than 5 cm in diameter and HCC is extremely rare. The present case is the first we have encountered in the last 20 years with a workload of more than 60–80 cases of AAA per year. In Japan, where the incidence of HCC is higher than the rest of the world, Komori *et al.* [7] have reported one case in 229 AAAs (0.4%).

Takeuchi and colleagues [2] have recommended that AAA repair should precede liver resection. According to the principles of liver surgery, cholecystectomy should be performed in any case of major hepatectomy for cancer. In the absence of gall bladder pathology, liver resection plus cholecystectomy is considered to be a 'clean' surgical procedure. Mainly for that reason, we think that hepatic resection could precede aneurysmectomy. This option permits better monitoring of the general status of the patient, especially the coagulation profile, and thus insertion of an arterial graft can be performed safely. It also gives more time for inspection of bile duct integrity and control of any bile leakage, which should be corrected intraoperatively.

In conclusion, combined liver resection and AAA repair in either order appears to be safe and carries a low risk of graft infection.

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